

METHODS FOR FABRICATING LITHOGRAPHY APPARATUSCross-Reference to Related Applications

This application is related to U.S. Serial No. 09/698994, 10/27/00, entitled "Methods For Fabricating Stencil Masks", which has a common assignee and one common inventor and is being filed concurrently with this application.

Field of the Invention

This invention relates to lithography, and more particularly, to masks used in lithography and mask support structures and their preparation.

Background of the Invention

As the size of electronic components used in integrated circuits has shrunk and their density in circuits increased, there has been growing interest in electron beam lithography. In electron beam lithography, an electron beam is used to write patterns on an electron beam resist layer formed over a top surface of the semiconductor wafer that is the workpiece for the electron beam lithography. A particular form of electron beam lithography of special interest for the invention is described as Scattering With Angular Limiting Projection Electron Beam Lithography ("Scalpel").

Scalpel is an electron beam lithography technique that typically has employed masks in which the mask used for control in the irradiation of the workpiece has been formed as a thin patterned coating supported on a thin membrane. Scalpel has been described in various publications.

The requirements for such a membrane-mask combination are quite demanding. Typically, it needs to be planar, relatively easy to make, and comparatively rugged. A particular problem has been the forming of the membrane that is to support the coating in which the mask pattern is formed. The membrane needs to be of relatively large area, typically at least several inches on a side, to be practical for use in large scale manufacture. It needs also to be very thin, typically no thicker than about 1000 Angstroms in thickness, to permit

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